emitters such as Cs-137. Historical records for INTEC suggest that Cs-137 was universally present in Tank Farm wastestreams, which accounts for its utility as an indicator contaminant. Differential movement of radionuclides by fluid and/or vapor transport could cause some separation of constituents that cannot be distinguished by Phase I logging.

- Beta emitters such as Sr-90 cannot be detected by the radiation logging system and can only be evaluated based on historical information concerning the original wastestreams. Sr-90 evaluation will be particularly difficult due to its solubility and tendency to move in the subsurface relative to Cs-137. .

4.6 Drum Sampling and Analysis

During advancement of the probeholes in the upper 4.5 m (15 ft) by vacuum extraction techniques, soil will be placed into drums in 5-ft lifts (0-5 ft, 5-10 ft, and 10-15 ft [0-1.5 m, 1.5-3 m, and 3-4.6 m]). The drums to be direct sampled will be selected based on the following methodology.

The probeholes are divided into two groups: (1) 85 probeholes that make up the grid covering the Tank Farm area, and (2) the 35 probeholes located in known or suspected hot spot areas. The 85 probeholes that make up the grid will be grouped, based on the gross count gamma readings taken on the vacuumed soils into an activity level distribution. This distribution will be used to select 20% of the probeholes for sampling. That is, a representative distribution of activity levels will be sampled in order to correlate sampling results with a range of activity levels in the drummed soil. Once the 17 probeholes (20% of 85 probeholes) have been selected, composite soil samples will be collected from each of the three drums (representing 0-5 ft, 5-10 ft, and 10-15 ft [0-1.5 m, 1.5-3 m, and 3-4.6 m]) from those probeholes. Thus, 51 composite samples will be collected and analyzed for radionuclides and metals identified in Table 4-1.

Samples will also be collected from each of the three drums associated with 50% of, the 35 probeholes located in hot spot areas (see figures 4-4, 4-5, and 4-6) totaling 18 locations. The drums to be sampled will be selected based on a representative distribution of activity levels in the drummed soil. Thus, 54 composite samples will be collected representing the 0-5 ft, 5-10 ft, and 10-15 ft (0-1.5 m, 1.5-3 m, and 3-4.5 m) intervals from 18 of the 35 hot spot probeholes. The samples will be analyzed for radionuclides and metals identified in Table 4-1. Cold test demonstration planning will address the drum sampling technique. Samples will be packaged and transported as described in Section 7.7, Shipping Screening.

4.7 Cold Test Demonstration

A cold demonstration of the Tank Farm soil investigation tasks is planned to demonstrate activities and to gather operational data for the Phase I investigation at the Tank Farm. The demonstration will evaluate the methods used, potential risks, and worker exposure associated with drilling in the OU 3-14 Tank Farm soil. The activities to be conducted during the demonstration includes: (1) surface gamma-ray mapping; (2) installation of the probehole casing using both vacuum extraction and the direct push drilling; and (3) downhole gamma-ray logging of the newly installed probehole casing.'

The demonstrations is expected to be conducted near the southeast corner of INTEC Building 691. The alluvial deposits overlying the basalt bedrock are similar to those found within the Tank Farm. Although the demonstration will be conducted in an area anticipated to be free of radiological contamination, all radiological control and other necessary precautions will be taken and surface and downhole gamma-ray logging will be performed. These procedures will be conducted in order to demonstrate that all operations can be conducted successfully and properly in contaminated areas.

Table 4-1. Specific analyte list and sample requirements for Tank Farm soil samples.

Analysis	Analytical Requirements[d]	Sample Medium	Volume/Mass	Container Type[c]	Holding Time	Preservative
Gross Alpha (gross α)	1-7	Soil	$\geq$10g	Wide-mouth jar	Analyze within 6 months[a]	None
Gross Beta (gross β)	1-7 1-7	Soil	$\geq$10g	Wide-mouth jar	Analyze within 6 months[a]	None
Alpha Spectroscopy Americium (Am-241) Curium (Cm-242, 244) Neptunium (Np-237) Plutonium (Pu-238, 239/240, 242) Uranium (U-234, 235, 238)	1-7	Soil	$\geq$10g (per isotope or isotope combination)	Wide-mouth jar	Analyze within 6 months[a]	None
Gamma Spectroscopy Antimony (Sb-125) Cerium (Ce-144) Cesium (Cs-134, 137) Cobalt (Co-60) Europium (Eu-152, 154, 155) Manganese (Mn-54) Ruthenium (Ru-106) Silver (Ag-108m, 110m) Zinc (Zn-65) Other[e] (Results >2σ <u>and</u> > MDA)[e]	1-7	Soil	$\geq$200g (per sample)	16 oz wide-mouth jar	Analyze within 6 months[a]	None
Other Radionuclides Plutonium (Pu-241) Strontium (Sr-90)	1-7	Soil	$\geq$10g (per individual isotope)	Wide-mouth jar[b]	Analyze within 6 months[a]	None

Table 4-1. (continued).

Analysis	Analytical Requirements[d]	Sample Medium	Volume/Mass	Container Type[c]	Holding Time	Preservative
CLP (TAL) metals	1-6	Soil	250 mL	Wide-mouth glass jar	Analyze within 6 months, except analyze Hg within 28 days.[b]	4°C[c]

a. The holding time requirement of 6 months is described in 40 (CFR) 136 (EPA guidelines for analysis of pollutants) and is applied in the QAPjP as a general guideline. For analysis of radionuclides with short half-lives, the holding time will be adjusted accordingly and communicated to the laboratory in a project-specific TOS (contact the Sample Management Office (SMO) for more information on appropriate holding times).

b. EPA 1993, *Statement of Work Inorganic Analyses-Multi Media, Multi Concentration,* Contract Laboratory Program, ILM 030, June.

c. Certificate of cleanliness will be obtained for all lots of sample containers used.

D. The individual compounds and radionuclides and associated contract required detection limit are identified in the referenced table of the QAPjP (DOE/ID-10587, Revision 6, September 2000).

5. MEASUREMENT METHODS

5.1 Surface Radiation Mapping

The surface radiation detector will be man-portable or mounted on a small mobile platform suitable for maneuvering in tight spaces. To minimize the detector field of view, the detector will have side shielding and/or will be suitable for use close to the ground surface. The detector will be fitted with a device or other means to assure that it is placed at the same height above ground for each measurement (< 15 cm [6 in.]).

The plastic scintillation system will be operated in a counts/sec mode only. Noattempt will be made to calibrate the system to measure directly in pCi/g. Its usage will be limited to identifying areas having anomalous gamma-ray flux. Anomalous areas may be further investigated by soil sampling during Phase II field investigations. Previous applications of this technology have demonstrated Cs-137 detection limits below 10 pCi/g.

The data acquisition cart utilizes a simple navigation system to measure cartesian x, y position. Detector output and position are simultaneously recorded on a continuous basis during cart operation. The scintillation detector is surrounded by a lead brick shield designed to restrict the detector field of view. The effective field of view for the scintillation detector is approximately 6 × 4 ft when operated at a height of 6 in. above the ground surface and decreases for lower sensor heights (LMITCO 1998b). At the Tank Farm, the scintillation detector will be operated at approximately 3 in. above ground surface to provide a specified area of investigation while still permitting adequate ground clearance.

Surface radiation measurements will be compiled and used to develop maps showing the spatial distribution of radiation fields (in counts/sec) throughout the Tank Farm. After compilation of preliminary maps, several calibration points will be selected for use in converting counts/sec data into exposure data (mR/hr). The calibration will be performed by collecting standard health physics exposure measurements at the selected calibration sites (see Nucleon 1984) and using these measurements to form a mathematical relationship between exposure measurements in mR/hr and in situ radiation measurements in counts/sec. The derived mathematical relationship will then be used to convert in situ radiation maps into estimated exposure levels for the entire Tank Farm site. This will be addressed in the Safety Analysis Report (SAR) and the HASP revisions.

Surface mapping consists of the following tasks.

5.1.1 Site Survey

The surface radiation survey subcontractor shall place survey markers, as appropriate, to support the radiation survey on a 1.5 × 1.5-m (5 × 5-ft) grid. All unobstructed ground areas within the Tank Farm fence are to be included in the survey (see Figure 4-2). Final x, y position for each surface radiation measurement must be accurate within ±0.3 m (1 ft).

BBWI shall supply primary survey control to tie into the grid system. The surface radiation survey subcontractor shall conduct survey activities, as necessary, to tie surface radiation survey x, y coordinates into the following standard coordinate system:

- Idaho State Plane, East Zone, NAD27.

5.1.2 Mobilize Survey Instrument

The surface radiation survey subcontractor shall provide a field portable gamma radiation surface survey instrument with the following minimum specifications:

- Energy sensitivity range: 0.2 – 1.5 MeV or greater
- Measurement mode: gross count rate
- Shielding: side shielding preferable, but not required
- Other: configured for operation at a constant ground offset (less than 15 m [16 in.]).

The surface radiation survey subcontractor shall arrange for shipment of the radiation survey instrument and any necessary support equipment to and from the work site.

The surface radiation survey subcontractor shall perform a sensitivity study to establish appropriate survey parameters including minimum count times for the surface radiation survey instrument. This sensitivity study shall be conducted by making measurements using the surface radiation survey instrument at a site having known radiation fields close to the detection levels desired for the Tank Farm survey. The surface radiation survey subcontractor shall specify the location for the sensitivity study.

5.1.3 Conduct Field Survey

The surface radiation survey subcontractor shall perform the surface radiation survey on a 1.5 × 1.5-m (5 × 5-ft) grid. The sensor shall be positioned at a constant distance above the ground surface no greater than 15 cm (6 in.). During the field survey, the instrument shall be operated in gross counting mode. The survey shall extend to all unobstructed ground areas with the Tank Farm fence (approximately 1.3 hectares [3.2 acres]; see Figure 2). Operations shall be performed according to the approved surface radiation survey subcontractor procedures.

The surface radiation survey subcontractor shall perform regular field verification surveys to ensure that the radiation survey instrument operates consistently during the course of the surface survey program. The field verification procedure shall be documented in the surface radiation survey subcontractor work procedure as well as the field logbook.

5.1.4 Processing, Analysis, and Final Report

The surface radiation survey subcontractor shall download and back up raw data from the field instrument on a daily basis. Raw data shall be processed as necessary to produce final data sets, which for each data point shall include the following:

- x position
- y position
- Surface radiation survey instrument reading in counts/second.

The surface radiation survey subcontractor shall prepare a written draft report containing the following:

- Description of filed activities
- Description of equipment
- Results including maps showing distribution of gamma radiation activity

- Interpretation and recommendations.

The surface radiation survey subcontractor shall submit final processed data in digital format.

The surface radiation survey subcontractor shall prepare a final report as necessary to resolve one set of written comments on the draft report provided by the surface radiation survey subcontractor.

5.2 Subsurface Radiation Logging

Subsurface radiation logging will be conducted using a downhole NaI gamma-ray logging tool. The gamma-ray logging tool will be operated in a counts/sec mode to detect and record gross gamma radiation flux with depth. The logging tool will have no spectral capabilities and cannot be used to identify the radionuclide source of anomalous gamma-ray flux, nor can it be calibrated to indicate Cs-137 concentration in pCi/g. However, the system promotes efficient field operations and is capable of Cs-137 detection at lower levels.

The gamma-ray logging tool is deployed using a portable winch system that provides electronic output of detector readings and tool depth. Data are acquired using a field laptop computer. Graphical results showing gross gamma-ray flux are provided in real time.

Log plots will be produced for each probehole showing the variation of gamma-ray flux in counts/sec versus depth. Log plots for adjacent probeholes will be compared as a means to recognize continuity between high radiation flux zones. Correlation between log plots will be used as a basis to estimate the combined horizontal and vertical extent of continuous contamination zones, thus permitting initial estimates of the number and volume of contamination zones.

5.2.1 Site Survey

The subsurface radiation logging subcontractor shall find and mark existing borehole locations using Figure 4-1 as a guide. Boreholes shall be flagged with appropriate markers that include the borehole name. The flagged location shall be surveyed to obtain coordinates for each borehole. These coordinates shall be referenced to the project-specific coordinate system.

5.2.2 Mobilize Survey Instrument

Where Cs-137 is historically known to have been present at each of the Tank Farm sites, it is used as an indicator to find other contaminants. Therefore, the logging instrument was chosen specifically for detection of Cs-137 gamma rays (0.662 MeV).

Subsurface radiation logging shall use a field-portable gamma-ray radiation logging system with the following minimum specifications.

- Energy sensitivity range: 0.2 – 1.5 MeV or greater
- Measurement mode: gross count rate
- Tool diameter: 4.45 cm (1.75 in.) maximum outer diameter
- Winch/lift capacity: at least 15.24 m (50 ft)
- Winch/lift depth control accuracy: ± 0.031 cm (0.1 ft).

A sensitivity study shall be performed to establish appropriate survey parameters including minimum count times for the downhole gamma-ray survey instrument. The sensitivity study shall be conducted by making measurements using the downhole gamma-ray survey instrument in an existing borehole having known radiation fields that range from background radiation levels to the radiation levels of interest for the Tank Farm survey. The location for the sensitivity study shall be identified and reported in the field logbook.

5.2.3 Conduct Field Survey

A downhole gross gamma-ray radiation survey will be performed in all accessible existing boreholes and all new probeholes. Survey measurements shall be obtained at a maximum depth interval of 0.15 m (0.5 ft), beginning at the lowest depth obtainable in each borehole and continuing upward to within 0.31 m (1 ft) of the ground surface. Operations shall be performed according to the approved procedures.

Regular field verification surveys will be performed to ensure that the radiation field and logbooks survey instrument operates consistently during the course of the downhole logging program. The field verification procedure shall be documented in the subsurface radiation logging subcontractor work procedure.

Field summary plots showing variation in gross gamma-ray counts as a function of depth for each logging run will be available within 24 hours following completion of logging in each borehole and probehole. The data shall also be backed up separately from the field laptop computer.

Historically, it has been noted that water has been found in the existing boreholes. A water level measurement will be taken before logging these boreholes. If water is found, the logging probe will be sleeved to preclude decontamination measures or the subsurface radiation logging subcontractor will decide not to log that hole. The RCT will monitor the equipment according to existing subsurface radiation logging subcontractor procedures. Smears will be taken before the tool is moved to the next logging location. If required, the subsurface radiation logging subcontractor shall perform all decontamination procedures. The procedure will be in accordance with TPR-52 and FSP (DOE-ID 2000c).

5.2.4 Processing, Analysis, and Final Report

The raw data from the field instrument will be downloaded on a daily basis. Raw data shall be processed as necessary to produce final data sets, which for each data point shall include the following:

- Well name
- Depth
- Instrument gross gamma-ray reading in counts/sec.

A written report will be prepared containing the following:

- Description of field activities
- Description of equipment
- Instrument calibration documentation
- Results including gamma-ray radiation log plots
- Interpretation and recommendations.

6. SAMPLE DESIGNATION

6.1 Sample Identification Code

A systematic character identification code will be used to uniquely identify all physical samples collected. Uniqueness is required for maintaining consistency and preventing the same identification code from being assigned to more than one sample.

For the new boreholes, the first two designators of the code refer to the Environmental Classification Area (ECA) from which the sample originated. The third designator refers to either the grid or hot spot location. A two- to three-character set (**01**, **02**, etc.) will be used for the fourth through sixth designators of the code to identify the sequential sample number for the tank farm, which includes the sample intervals. Refer to the SAP table database in Appendix A for specific analysis code designations.

For example, a subsurface soil sample collected in support of the OU 3-14 Tank Farm sampling might be designated as "**TFG015**," where (from left to right):

- **TF** designates the sample as being collected from the Tank Farm
- **G** denotes the modified grid location (or H for the Hot Spot location)
- **01** designates the sequential sample number for the tank farm where the QC samples also have their own unique numbers.

This information is designated on the field guidance forms and sample labels.

A SAP table/database will be used to record all pertinent information associated with each sample ID code. For the existing boreholes, refer to Appendix B. No analytical samples will be taken from the existing boreholes because only gamma radiation logging data will be obtained.

6.2 Sampling and Analysis Plan Table/Database

6.2.1 General

A SAP table format was developed to simplify the presentation of the sampling scheme for project personnel. It is developed based on planned sample locations, required analyses, and the analytical laboratory requirements. For the OU 3-14 project, the final SAP table will be developed following identification and procurement of the analytical laboratories, which will support the project. The following sections describe the information recorded in the SAP table/database, which are presented in Appendix A.

6.2.2 Sample Description Fields

The sample description fields contain information relating individual sample characteristics.

Sampling Activity—The sampling activity field contains the first six characters of the assigned sample number. The sample number in its entirety will be used to link information from other sources (field data, analytical data, etc.) to the information in the SAP table for data reporting, sample tracking, and completeness reporting. The sample number will also be used by the analytical laboratory to track and report analytical results.

Sample Type—Data in this field will be selected from the following:

- REG For regular and QA/QC samples
- REG/QC For duplicate samples
- QC For trip blank, field blank, and equipment rinsate.

Media—Data in this field will be selected from the following:

- Soil For regular and QA/QC samples
- Water For QA/QC samples

Collection Type—Data in this field will be selected from the following:

- PES For a performance evaluation sample (FBLK = field blank, RNST = equipment rinsates, TBLK = trip blank)
- Composite For a composite sample

Planned Date—This date is related to the planned sample collection start date.

6.2.3 Sample Location Fields

This group of fields pinpoints the exact location for the sample in the three-dimensional space, starting with the general AREA, narrowing the focus to an exact location geographically, and then specifying the DEPTH in the depth field.

Area—The AREA field identifies the general sample-collection area. This field should contain the standard identifier for the INEEL area being sampled. For this investigation, samples are being collected from the sites associated with the INTEC Tank Farm. The AREA field identifier will correspond to this site identifier.

Location—This field may contain geographical coordinates, x-y coordinates, building numbers, or other location identifying details, as well as program specific information such as borehole or well number. Data in this field will normally be subordinate to the AREA. This information is included on the labels generated by the SMO to aid sampling personnel.

Type of Location—The type of location field supplies descriptive information concerning the exact sample location. Information in this field may overlap that in the location field, but it is intended to add detail to the location.

Depth—The DEPTH of a sample location is the distance in feet from surface level or a range in feet from the surface.

6.2.4 Analysis Types

These fields indicate analysis types (radiological, chemical, etc.). Space is provided at the bottom of the form to clearly identify each type. A standard abbreviation will also be provided if possible.

7. SAMPLING EQUIPMENT, PROCEDURES, AND WASTE MANAGEMENT

The following sections describe the sampling equipment and procedures to be used for the planned sampling and analyses and field measurements described in this FSP. Before any sampling activities begin, a prejob briefing will be held to review the requirements of the FSP, HASP, and other work controlling documentation and to verify that all supporting documentation has been completed. In addition, at the termination of the sampling activities, a post-job review will be conducted, in accordance with MCP-3003, "Performing Pre-Job Briefings and Post-Job Reviews."

7.1 Sampling Requirements and Field Work

The OU 3-14 Tank Farm investigation will include surface gamma radiation survey, downhole gamma radiation survey, and collection of soil samples from the upper 4.5 m (15 ft). The sampling requirements addressed in this FSP include field data collection, monitoring equipment installation, and soil samples collection.

7.2 Vacuum Extraction Equipment

Samples will be surveyed for external contamination and field screened for radiation after sample collection and before packaging for shipment. The shipping container will also be surveyed for external contamination before removal from the sampling area. Radiological Control stickers indicating the survey results for gamma and alpha dose levels will be placed on each container. Removal of containers from the sampling area will be under the discretion of RCTs.

A sample will be sent to the INTEC laboratory for a 20-minute gamma screening if determined to be necessary by Radiological Control. Results of the screening and process knowledge will be used to scale alpha and beta isotopes in relation to gamma activity and the total activity will be calculated to ensure that the shipment does not exceed the 70 Bq/g DOT limit as provided under 49 CFR.

7.3 Push Probe Equipment

Probehole casings will be installed using direct push technology. No direct push or sampling equipment, other than the probehole casing, will come in contact with the soil. The prudent use of the equipment will ensure that no releases of contamination occur to the environment, and that all activities will be conducted in accordance with MCP-469, "NEPA and Environmental Permitting" and other appropriate MCPs. The subcontractor supplying the push probe equipment will work with INEEL radiological engineers and Tank Farm facility engineers to do the following activities:

- Modify existing subcontractor-owned equipment. The professionals will design and manufacture the necessary equipment that will provide radiation protection for personnel working with and around the direct push equipment. This will include all direct push and handling tools and equipment to transfer any soil cuttings from the probehole and deliver them to the drums.

- Design, modify, or retrofit equipment owned by the subcontractor to minimize cuttings. All aspects of this project will keep waste production to a minimum.

- Design, modify, or retrofit subcontractor-owned equipment so that it can be maneuvered to fit within the limited pushing locations while providing maximum working space for personnel.

- Design platforms or structures for steep berm or ditch locations so that pushing and sampling equipment can accomplish the sampling.

- Design, modify, and manufacture or retrofit subcontractor-owned pushing and sampling equipment to meet the Tank Farm weight restrictions identified in Attachment C.

- Design, modify, and manufacture, or retrofit subcontractor-owned equipment that will ensure that no damage occurs to nearby underground structures.

The position of the direct push rig and the sampling location will be reviewed and approved by the Tank Farm engineers before beginning any sampling activities. Some of the pushing locations are on steep banks and may require the design and manufacture of pushing platforms that will support the direct push rig during pushing operations. The platform design and final assembly will be reviewed, inspected, and approved by the recognized professional engineer or structural engineer, Tank Farm engineers, and the appropriate INEEL safety personnel.

7.4 Personal Protective Equipment

The PPE required for this sampling effort is discussed in the HASP.

Before disposal of used PPE, a hazardous waste determination will be completed by means of the requirements set forth in MCP-444, "Characterization Requirements for Solid and Hazardous Waste."

7.5 Pushing and Sampling Equipment Decontamination

All pushing equipment will be steam cleaned before the Tank Farm area is entered. Decontamination of pushing equipment between probeholes is unnecessary, as the probe and steel casing will remain in the ground. Sampling equipment (auger, etc.) will be field cleaned in accordance with SOP 11.5, "Field Decontamination of Sampling Equipment," between sampling runs.

The decontamination methods for the pushing and sampling equipment will ensure containment of all decontamination fluids, minimize waste, and minimize contamination of equipment. Decontamination of the field equipment for the Tank Farm pushing will be performed as per SOP 11.4, "Field Decontamination of Heavy Equipment, Direct Push Rigs, and Pushing Equipment," and SOP 11.5, "Field Decontamination of Sampling Equipment." In addition, evaluation of decontamination measures will be made during the field demonstration. Modifications will also be made, if necessary, to ensure that containment, proper waste segregation, and waste minimization procedures (see Section 7.3) will be in place prior to the start of pushing inside the Tank Farm.

7.6 Sampling Location Surveys

After installation of probeholes, downhole logging, and sampling are complete, all probehole location points will be surveyed in accordance with the requirements set forth in MCP-227, "Sampling and Analysis Process for Environmental Management Funded Activities."

7.7 Shipping Screening

Samples will be surveyed for external contamination and field screened for radiation sample collection and before packaging for shipment. The shipping container will also be surveyed for external contamination before removal from the sampling area. Radiological Control stickers indicating the survey results for gamma and alpha dose levels will be placed on each container. Removal of containers from the sampling area will be under the discretion of RCTs. A sample will be sent to the INTEC laboratory for a 20-minute gamma screening if deemed necessary by Radiological Control. Results of the screening and process knowledge will be used to scale alpha and beta isotopes in relation to gamma activity and the total activity will be calculated to ensure that the shipment does not exceed the 70 Bq/g DOT.

If it is determined that the contact readings on the samples exceed 200 mR/hour, then the samples will be held for analyses in the INTEC Analytical Laboratories.

7.8 Management of Sampling Waste

IDW waste generated during the OU 3-14 field investigation may include the following items:

- Contaminated PPE, wipes, bags, and other paper and plastic trash
- Contaminated push drilling and sampling equipment
- Aqueous decontamination solutions
- Metal and wood debris (temporary push drilling platforms)
- Unused, unaltered, and altered sample material
- Used sample containers and disposable sampling equipment
- Aqueous and liquid organic analytical waste
- Analytical debris (glassware, pipettes, etc.)
- Used soil drums.

The disposition and handling of waste for this project will be consistent with the Phase I *Waste Management Plan for the WAG 3, OU 3-14 Remedial Investigation/Feasibility Study* (INEEL 2000). Samples will be handled in accordance with MCP-2864, "Sample Management." All wastestreams generated from the project will be characterized in accordance with this FSP or MCP-63, "Waste Generator Services-Conditional Industrial Waste Management," and will be dispositioned accordingly.

7.8.1 Waste Management

The following items will be covered in the Waste Management Plan:

- Hazardous waste determination
- Waste minimization and segregation
- On-Site waste management requirements
- Waste management and final disposal.

8. DOCUMENT MANAGEMENT AND SAMPLE CONTROL

Section 8.1 summarizes document management and sample control. Documentation includes field logbooks used to record field data and sampling procedures, chain of custody (COC) forms, and sample container labels. Section 8.2 outlines the sample handling and discusses COC, radioactivity screening, and sample packaging for shipment to the analytical laboratories. The analytical results from this field investigation will be documented in reports and used as input for defining the background conditions in computer models.

8.1 Documentation

The sample FTL will be responsible for controlling and maintaining all field documents and records, and for verifying that all required documents will be submitted to the INEEL ER Administrative Records and Document Control (ARDC). All entries will be made in indelible black ink. Drawing a single line through the error, and entering the correct information will correct errors. The corrections will be initialed and dated.

8.1.1 Sample Container Labels

Waterproof, gummed labels generated from the SAP database will display information such as the unique sample ID number, the name of the project, sample location, and analysis type. Labels will be completed and placed on the containers in the field before sample collection. Information necessary for label completion will include sample date, time, preservative used, field measurements of hazards, and the sampler's initials.

8.1.2 Field Guidance Form

Field guidance forms verifying unique sample numbers provided for each sample location will be generated from the SAP database. These forms contain the following information:

- Media
- Sample ID numbers
- Sample location
- Aliquot ID
- Analysis type
- Container size and type
- Sample preservation.

8.1.3 Field Logbooks

Field logbooks will be used to record information necessary to interpret the analytical data in accordance with ARDC format, and controlled and managed according to MCP-231, "Logbooks."

8.1.3.1 Sample Logbooks

The field teams will use sample logbooks. Each sample logbook will contain the following information:

- Physical measurements
- All QC samples
- Sample information (sample location, analyses requested for each sample, sample matrix)
- Shipping information (collection dates, shipping dates, cooler ID number, destination, COC number, name of shipper).

8.1.3.2 Sample Field Team Leader's Daily Logbook

A project logbook maintained by the sample FTL will contain a daily chronological summary of the following items:

- All field team activities, including locations worked at
- List of site contacts
- Problems encountered.

This logbook will be signed and dated at the end of each day's sampling activities.

8.1.3.3 Site Attendance Logbook

A project logbook maintained by the FTL that will contain a daily summary of:

- Names of field personnel at the job site
- Company affiliation
- Time of entry to and exit from job site .

8.1.3.4 Field Instrument Calibration/Standardization Logbook

A logbook containing records of calibration data will be maintained for each piece of equipment requiring periodic calibration or standardization. This logbook will contain logsheets to record the date, time, method of calibration, and instrument ID number. Calibration will be performed in accordance with MCP-2391, "Calibration Program."

8.2 Sample Handling

Analytical samples for laboratory analyses will be collected in precleaned, laboratory-certified containers and packaged according to the American Society for Testing and Materials, or EPA-recommended procedures. The QA samples will be included to satisfy the QA/QC requirements for the field operation as outlined in the QAPjP (DOE-ID 2000b). Qualified (SMO approved) analytical and testing laboratories will analyze the samples.

8.2.1 Sample Preservation

Soil samples will be preserved immediately upon sample collection per the requirements in the QAPjP (DOE-ID 2000b). All soil, rinsate, and QA/QC samples will be placed in coolers containing frozen, reusable ice immediately after sample collection and survey by RADCON . According to the QAPjP, samples will be maintained at 4°C and preserved with acid, etc., immediately after sample collection as required.

8.2.2 Chain of Custody Procedures

The chain of custody procedures will be followed in accordance with MCP-244, "Chain of Custody, Sample Handling, and Packaging for CERCLA Activities," and the QAPjP. Sample containers will be stored in a secured area accessible only to the field team members.

8.2.3 Transportation of Samples

Samples will be shipped in accordance with the regulations issued by the DOT (49 CFR Parts 171 through 178) and EPA sample handling, packaging and shipping methods (40 CFR 262.30). Samples will be packaged in accordance with the requirements set forth in MCP-244.

8.2.3.1 Custody Seals. Custody seals will be placed on all shipping containers in such a way as to ensure that sample integrity is not compromised by tampering or unauthorized opening. The seals will be signed by a member of the field team. Clear, plastic tape will be placed over the seals and the signature to ensure that the seals are not damaged during shipment.

8.2.3.2 On-Site and Off-Site Shipping. An on-Site shipment is any transfer of material within the perimeter of the INEEL. All materials to be shipped on-Site or off-Site will be properly characterized in compliance with DOT requirements under 49 CFR 173.2 and pertinent DOE orders. All shipping containers and related papers/manifests will have the proper shipping names as provided under 49 CFR 172.101. Site-specific requirements for transporting samples within INEEL boundaries and those required by the shipping and receiving department will be followed. Shipment within the INEEL boundaries will conform to DOT requirements as stated in 49 CFR. Off-Site sample shipment will be coordinated with INEEL Packaging and Transportation personnel, as necessary, and will conform to all applicable DOT requirements.

8.2.3.3 Nuclear Material Control and Accountability. The past sampling and analysis results for soil samples collected in the Tank Farm indicate that a potential exists for exceeding the minimum reporting quantities specified in PLN-123, "Materials Control and Accountability Plan." Transfers of accountable nuclear material to, from, and within the INEEL must be controlled and monitored. Instructions for shipment and receipts of nuclear materials are provided in MCP-2752, "Shipment and Receipts of Nuclear Material." If required, these will be adhered to through coordination with the appropriate Nuclear Material Custodians and Packaging and Transportation personnel.

8.3 Document Action Requests

Revisions to this document will follow INEEL MCP-230, "Environmental Restoration Document Control Center Interface."

9. REFERENCES

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